Remarks

1) Applicant thanks the Examiner for her Office Action, and for the interview conducted January 15th 2009. This amendment reflects the agreements arrived at the interview and acts as a summary thereof.

2) Claims 1-17 are pending in the action. Claims 1-8 and 10-17 stand rejected, while claim 9 is objected to. Claims 1 and 6 are amended hereby for better readability, and to avoid unnecessary duplication.

3) Claims 1-8 and 10-17 stand rejected under 35 U.S.C.§ 103(a) over Herman et al. (US 6,543,274) in view of Yen et al. (US 4,513,261). Applicant respectfully submits that none of the references cited in the Office Action discloses the feature of a single sensor providing sufficient information to measure the density of the fluid as claimed in claim 1 or to measure the viscosity of the fluid as claimed in claim 6. Thus applicant respectfully requests that the rejection will be reconsidered and withdrawn.

4) The present invention requires the use of infinite impulse response (IIR) resonators. Such resonators employ energy trapping to store incident energy within a finite volume with "infinite" impulse responses, limited in time by the rates or reradiation of energy and dissipation of energy through internal losses.

5) Paragraph [0044] of the original specifications of the present application state: *"For the purpose of these specifications, The resonant mechanical structure (resonator) is considered 'embedded' in the piezoelectric substrate if it confines acoustic waves within the substrate or at the surface of the substrate, whether or not the whole resonator is contained within the substrate."*

6) Additional inferences as to the nature of a resonator as claimed by the present invention may be found by way of example, in paragraphs [0039], [0040], from the fact that the specifications describe the resonators as "acoustic structures of either mirrored plate or grating reflector types" (paragraph [0041]), by the wave propagation depiction in Fig. 4 (435, 445), and elsewhere in the specifications.

7) Neither Herrmann nor Yen discloses the claimed limitation requiring sufficient coupling between the input and output resonant structures to provide the claimed transfer function. As the references, taken alone or in combination, fail to disclose all the claimed limitations as required, the Office failed to show a *prima facie* case of obviousness.

8) Herrmann et al. specifically states that "at least two basic sensor elements" are utilized Col. 2, ll. 42-50, col. 4, ll. 23-25, Col. 6, ll. 12-18, and elsewhere throughout the Herrmann patent. A basic examination of Hermann's Fig. 1 clearly shows that the two elements are simply two separate sensors, one being the responsive sensor with liquid traps, and the other being a reference sensor without, each with its own set of transducers, which merely co-reside on a single quartz substrate. There is no teaching or suggestion of coupling between the two structures and the relative geometries of the figure would preclude any such coupling. Thus the Herrmann reference clearly negates the claimed limitation of providing all the information for measuring the required parameters from a single sensor element.

9) Yen et al. is directed to a low loss acoustic filter. Yen discusses geometric and time-domain symmetry and asymmetry of the sequence of samples in two electrically co-joined transducers. The transducers are connected such that the primary time delayed signal is additively combined whereas the multiply reflected "triple transit" signals are destructively combined. Yen describes a reflection-free delay line (transversal or finite impulse response) filter, which is the antithesis of a resonator (infinite impulse response) filter. The present invention employs two tightly coupled resonant structures integrated into a single electrical device whereas Yen aims to eliminate all possible resonances (Col. 5, ll. 5-21). The present invention seeks a single acoustic wave device having two well defined coupled resonances in the

frequency domain and an infinite impulse response in the time domain whereas Yen seeks no frequency domain resonances and, as stated above, seeks the cancellation of all time domain signal beyond the intended finite impulse response.

10) Notably, Yen does NOT provide a 180 degrees TRANSFER FUNCTION as claimed. A transfer function is a function as compared between the input and the output of a device. Within the Yen device there are waves that are received at a common point that are at 180 degrees from each other, and therefore combine destructively. However there is no 180 degrees phase shift transfer function between the input and the output, as claimed in the present invention. Moreover, there is no resonant frequency having such a phase shift as Yen teaches the elimination of resonance.

11) The methods and structures of Yen cannot be applied to IIR resonant structures. Furthermore the methods and structures of Yen couple elements within a single AWD and, as such, they are unable to couple two distinct AWDs to create an integrated structure as claimed.

12) Thus both the Yen and the Hermann patents teach away from the present invention. Therefore, the skilled artisan would not be motivated to combine the Yen patent with the Herman patent, but on the contrary driven away from such combination. Furthermore, such a combination could not result in a device through which one could practice the present invention as claimed.

13) Further, In the case of Yen the left and right transducers are directly connected and employed as two halves of a single transducer. Even if, arguendo, one was to accept the internal destructive wave cancellation within the Yen device as a 180 degrees phase shift or transfer function, one will need to apply similar structure to the present invention to obtain such result. However applying Yens' teachings to the present invention utilizing the operational mode disclosed by Yen, would be analogous to electrically connecting the two transducers to obtain a single pole, single port

resonator having a single resonant frequency, thus impermissibly destroying the operation of the present inventions' device.

14) The mere fact that references CAN be combined or modified does not render the resultant combination obvious UNLESS the prior art also suggests the desirability of the combination (See In re Mills, 916 F2.d 680, Fed Cir. 1990). The Herrmann reference utilizes a different method for achieving the goal of measuring viscosity and/or density necessitating the use of at least two separate and distinct sensor elements to perform this function. There is no suggestion or motivation to modify the reference to obtain the same results with a single sensor, as such would have destroyed the mere reason for the second sensor element in the Herrmann patent, as well as would radically change its mode of operation.

15) Further, as a rational for combining the references the Office stated that *"the skilled artisan would be motivated to combine the teachings of Herman et al. and Yen et al. since Herman et al. states that his invention is applicable to determining density of a fluid including an two port resonator/filter and Yen et al. is directed to acoustic filter"*. Applicant respectfully disagrees. The Herman et al. reference ONLY mention of a filter relates to a low-pass filter 33 (col. 6, ll. 18) which is separate and distinct from the acoustic wave device.

16) In summary, applicant submits that the rejection of the present claims is improper at least for the following reasons:

- The combination of the references does not teach all claims limitations, namely the coupling between the first and second resonators.
- Combining the Herrmann and Yen patents is impermissible, as no motivation is provided to combine the references.
- The result of combining the references would not have been expected by the skilled in the art lacking the teaching of the present invention.

- Combining the references would render at least the Yen device unsatisfactory for its intended purpose
- Modifying the present invention using the Yen internal operational mode would render the present invention inoperative.
- At least the Yen reference relates to a finite impulse response, and combining a finite and infinite impulse response devices would clearly not be obvious.
- Both references teach away from the present invention.

For all the reasons stated above, applicant submits that the Office failed to show *prima facie* evidence of obviousness of the present invention as claimed.

17) Should the Examiner find any deficiency in this amendment or in the application, or should the Examiner believe for any reason, that a conversation with applicant's agent may further the allowance and issuance of this application, the Examiner is kindly requested to contact Shalom Wertsberger at telephone (207) 799-9733.

18) Applicant has made a good faith effort to address each and every point made by the Examiner. In light of the showing and all other reasons stated above, applicant believes that the rejections and objections presented by the Examiner in the office action mailed to applicant on September 5, 2008 were overcome. Applicant therefore submits that the claims are in condition for allowance. Reconsideration and withdrawal of the rejections and objections is hereby requested, and issue of a notice of allowance on all pending claims is respectfully solicited.

Respectfully submitted

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